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Kamen et al.(10) **Pub. No.: US 2020/0171241 A1**(43) **Pub. Date: Jun. 4, 2020**(54) **SYRINGE PUMP AND RELATED METHOD**

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(Continued)

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Martin D. Desch, Newburyport, MA (US)**Publication Classification**(51) **Int. Cl.****A61M 5/172** (2006.01)**A61M 5/142** (2006.01)**G16H 40/63** (2006.01)**G16H 20/17** (2006.01)(52) **U.S. Cl.**CPC **A61M 5/172** (2013.01); **A61M 2205/103** (2013.01); **A61M 5/142** (2013.01); **G16H 40/63** (2018.01); **G16H 20/17** (2018.01); **A61M 2205/8206** (2013.01); **A61M 2205/6054** (2013.01); **A61M 2205/587** (2013.01); **A61M 2205/581** (2013.01); **A61M 2205/52** (2013.01); **A61M 2205/505** (2013.01); **A61M 2205/50** (2013.01); **A61M 2205/3584** (2013.01); **A61M 2205/3365** (2013.01); **A61M 2205/3334** (2013.01); **A61M 2205/3331** (2013.01); **A61M 2205/332** (2013.01); **A61M 2205/18** (2013.01); **A61M 2205/16** (2013.01); **A61M 5/14236** (2013.01)(21) Appl. No.: **16/788,531**(22) Filed: **Feb. 12, 2020****Related U.S. Application Data**

(63) Continuation of application No. 15/635,391, filed on Jun. 28, 2017, now Pat. No. 10,561,787, which is a continuation of application No. 13/833,432, filed on Mar. 15, 2013, now Pat. No. 9,744,300, which is a continuation-in-part of application No. 13/333,574, filed on Dec. 21, 2011, now Pat. No. 10,453,157, which is a continuation-in-part of application No. PCT/US11/66588, filed on Dec. 21, 2011, which is a continuation-in-part of application No. 13/723,238, filed on Dec. 21, 2012, now Pat. No. 9,759,369, which is a continuation-in-part of application No. 13/333,574, filed on Dec. 21, 2011, now Pat. No. 10,453,157, which is a continuation-in-part of application No. PCT/US11/66588, filed on Dec. 21, 2011, said application No. 13/833,432 is a continuation-in-part of application No. 13/723,235, filed on Dec. 21, 2012, now Pat. No. 9,400,873, which is a continuation-in-part of application No. 13/333,574, filed on Dec. 21, 2011, now Pat. No. 10,453,157, which is a continuation-in-part of application No. PCT/US11/66588, filed on Dec. 21, 2011, said application No. 13/833,432 is a continuation-in-part of application

(57)

ABSTRACT

A syringe pump includes a lead screw, a motor, and a sliding block assembly. The lead screw has threads and the motor is coupled to the lead screw to rotate it. The half-nut housing has a half nut and a barrel cam. The half nut is disposed within the half-nut housing. The half nut has half-nut threads at an end adjacent to the lead screw void. The half nut engages or disengages with the threads of the lead screw. The half nut includes a half-nut cam-follower surface and a half nut slot. The barrel cam is disposed within the half-nut housing and engages with the half-nut cam-follower surface. The barrel cam includes a pin to fit within the half nut slot such that the barrel cam rotates between a first position and a second position to actuate the half nut between the engagement position and the disengagement position, respectively.

